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MONOCELIDIDAE (PLATYHELMINTHES: PROSERIATA) FROM PUERTO RICO. I. GENERA *MINONA* AND *MONOCELIS*

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Abstract.—Three new species of Monocelididae from Puerto Rico are described as *Minona puertoricana, Minona paulmartensi,* and *Monocelis alboguttata. Minona bermudensis* Ax & Sopott-Ehlers, 1985, *Minona gemella* Ax & Sopott-Ehlers, 1985, *Minona peteraxi* Karling, 1978, previously known from Bermuda, and *Monocelis tabira* Marcus, 1950, known from southern Brazil, have also been found in Puerto Rico. Karyotypes are given for all species.

Knowledge on taxonomy and distribution of the family Monocelididae (Platyhelminthes: Proseriata) on the east coast of tropical America is scanty and limited to Bermuda (Ax & Sopott-Ehlers 1985, Karling 1978) and southern Brazil (Marcus 1946, 1949, 1950, 1951, 1954a). Research carried out recently in Puerto Rico resulted in a significant contribution to the knowledge of the group in the Caribbean area; the present first report deals with the genera *Minona* Marcus, 1946 and *Monocelis* Ehrenberg, 1831.

Materials and Methods

Samplings were performed in the proximity of the Marine Biological Station of Isla Magueyes (University of Puerto Rico, Mayaguez) (17°57′N, 67°05′W) in December 1988. Samples were collected by scooping the topmost layer of sediment. Granulometry indices (Md = graphic mean; QDI = Inclusive Graphic Quartile Deviation) are calculated according to Giere et al. (1988).

The following stations were sampled:

St. I: Magueyes Is., moderately sheltered beach among mangroves: a) intertidal, poorly sorted granule (Md = −1.73; QDI = 1.86). Silt-clay fraction: 1.20%. b) Upper subtidal (−20/−30 cm), thin oxidized layer of poorly sorted medium sand (Md = 1.97; QDI = 1.51). Silt-clay fraction: 17.15%.

St. II: Magueyes Is., moderately sheltered beach, upper subtidal (−10 cm). Poorly sorted very coarse sand (Md = −0.46; QDI = 1.26). Silt-clay fraction: 0.91%.

St. III: Magueyes Is., sheltered beach among mangroves; −10/−20 cm. Poorly sorted medium sand (Md = 1.3; QDI = 1.54). Silt-clay fraction: 13.58%.

St. IV: Harbour of La Parguera. Extremely poorly sorted very coarse sand, with appreciable amount of particulated organic matter and oil; about 30 cm deep. Md = −0.81; QDI = 4.07. Silt-clay fraction: 6.53%.

St. V: Caballo Blanco reef, −16 m. Poorly sorted medium sand (Md = 1.4; QDI = 1.28). Silt-clay fraction: 14.62%.

St. VI: Turrumote Cay, exposed beach, intertidal, poorly sorted granule (Md = −1.0; QDI = 1.44). Silt-clay fraction: 0.1%.

St. VII: Turrumote Cay, internal lagoon (connected with the sea at the time of samplings), poorly sorted granule, −20 cm (Md = 1.1; QDI = 1.04). Silt-clay fraction: 0.2%.

St. VIII: Turrumote Cay, channels between rocky and *Montastraea* outcrops, −10 m. Poorly sorted very coarse sand (Md = −0.15; QDI = 1.95). Silt-clay fraction: 0.92%.

Living specimens were isolated with the $MgCl_2$ technique (see Martens 1984). Observations on the anatomy and comparative length of pore indices (a: mouth-vagina; b: vagina-male pore; c1: male pore-accessory organ pore; c2: accessory organ pore-female

pore [or c: male pore-female pore, for species of the genus *Monocelis,* without accessory organ]; d: female pore-caudal tip) (see Karling 1966 and Tajika 1982) were performed on slightly squeezed living specimens. Permanent mountings were done with lactophenol. Types and all collected specimens are deposited in the collection of the Dipartimento di Biomedicina Sperimentale, Infettiva e Pubblica, University of Pisa (BIO).

The karyotype was determined on lactic-acetic orcein stained spermatogonial mitoses, as described by Curini-Galletti et al. (1989). Absolute (a.l.) and relative lengths (r.l. = length of chromosome $\times 100$/total length of the haploid genome) and centromeric indices (c.i. = length of short arm $\times 100$/length of entire chromosome) were obtained from measurements of camera lucida drawings of at least 10 metaphase plates. The idiograms in Fig. 4 are based on absolute lengths; karyometrical data are presented in Table 1. The chromosome nomenclature employed is that of Levan et al. (1964), and the fundamental number (NF) is according to Matthey (1949).

Genus *Minona*

Minona puertoricana, new species

Figs. 1, 4A

Type material.—One whole mount (holotype) (BIO-32).

Type locality.—Harbour of La Parguera, Puerto Rico (St. IV).

Studied material.—About 30 living specimens from stations Ib, II, III, IV. Two whole mounts (holotype, paratype (BIO-33)); 3 specimens used for karyology.

Etymology.—Named after the locality of collection.

Description.—Living worms about 2.3 mm in length, without pigment or eyespots. Cephalic end rounded, provided with ovoidal rhabdoid glands and conspicuous frontal glands. Posterior half of statocyst engulfed into the brain. Caudal end of body bluntly triangular, with numerous adhesive glands and rhabdoid glands similar to cephalic ones plus a few distinctly larger glands. Gut runs from behind brain to tail; tubular pharynx located in second third of body. Behind the pharynx a tranversal septum ("diaphragm") is present.

Approximately 20 testes present, arranged in two rows, anteriorly to pharynx. Copulatory bulb consists of a rather large seminal vesicle, with a diameter of about 55 μm, some prostate glands, and a weak penis papilla. Behind copulatory bulb an accessory organ is present, which has its own pore, and bears an elongated stylet that is 20.3 ± 3.2 μm (12 measurements).

Ovaries in front of pharynx; vitellaria stretch from anterior part to copulatory organs. A rather small bursa, generally rounded in shape, in some specimens more irregular, lies just behind the septum. Vaginal pore discernible in about half the mature specimens. Female duct runs from the bursa dorsally to copulatory bulb and opens caudally through the female pore, which is surrounded by numerous female glands.

Karyotype.—Haploid set made up of two chromosomes, one large metacentric and one small submetacentric with low index value (c.i.: 28.13). Absolute length of haploid genome: 9.3 ± 0.8 μm (Fig. 4A, Table 1).

Ecological notes.—In the upper subtidal of the studied area, *M. puertoricana* is the dominant monocelidid in coarse to medium sand, generally rich in silt-clay fraction, in sheltered conditions (harbours, beaches in mangrove areas); it is absent from dynamic environments. It is the only Proseriate (and indeed one of the few meiofaunal organisms) resistant to severe organic and hydrocarbon pollution in the inner harbor of La Parguera.

Diagnosis.—Unpigmented *Minona* species with four genital openings and an accessory stylet approximately 20 μm long. Pore indices: $b \gg a > d > c2 > c1$. Karyo-

type formula: 2N = 4: 1m + 1sm; haploid genome length: 9.3 μm. NF = 4.

Minona paulmartensi, new species
Figs. 2, 4B

Type material.—One whole mount (holotype) (BIO-46).

Type locality.—Turrumote Cay, Puerto Rico (St. VIII).

Studied material.—Three living specimens, one mounted in lactophenol (holotype), the others used for karyological purposes.

Etymology.—Named after Dr. Paul M. Martens, for his contribution to the study of the Monocelididae.

Description.—A minute (about 1.5 mm) and slender *Minona* species, without pigment or eyespots. Cephalic region rounded, provided with tiny oily droplets in front of statocyst; rhabdoid glands could not be discerned in living specimens both in cephalic and caudal region. Elongated tail provided with numerous adhesive glands. Tubular pharynx located in second third of body.

Approximately 8 testes, in a median row in front of the pharynx. Copulatory bulb markedly ovoidal, consisting of a round seminal vesicle, connected to a barely discernible penis papilla. Longer axis of bulb approximately 50 μm in length. An accessory organ, with its own pore and a stylet about 24 μm long, is situated behind copulatory bulb.

Ovaries in front of the pharynx. Vitellaria stretch from in front of testes to copulatory bulb. Oviducts fuse behind pharynx to form a common oviduct. In front of copulatory bulb this duct widens to form a small, ovoid bursa, provided with a weakly muscular vaginal pore. Common female duct runs over copulatory bulb and opens into the female pore, which is surrounded by female glands.

Karyotype.—Haploid set made up of three chromosomes, the smallest being about ⅔ the length of the largest. Chromosome 1 submetacentric, with a very low centromeric index (c.i: 27.65); chromosomes 2 and 3 subtelocentric. Absolute length of haploid genome: 8.5 ± 0.8 μm (Fig. 4B, Table 1).

Diagnosis.—Unpigmented *Minona* species with four genital openings, with a markedly ovoidal copulatory bulb, and an accessory stylet of about 24 μm. Pore indices: d > a > c1 > b > c2. Karyotype formula: 2N = 6: 1sm + 2st; haploid genome length: 8.5 μm. NF = 4.

Discussion.—Both new species have four genital pores, are unpigmented, and lack eyespots. Other species with this combination of characters are: *M. degadti* Martens, 1983; *M. pelvivaginalis* Tajika, 1982; *M. dolichovesicula* Tajika, 1982; and *M. cornupenis* Karling, 1966. *M. degadti,* from the North Sea, is distinguished by its stylet, which bears a lateral tooth; furthermore, in this species distance b is very short, i.e., the vagina is very close to the male pore. *Minona pelvivaginalis* from Japan has copulatory bulb and accessory organ lying close to each other and in the same plane, has a stylet 30 μm long and 30–40 testes. *Minona dolichovesicula* has been reported from Japan and northwest U.S.A., though these populations are distinct for the length of the accessory stylet (48 μm and 20 μm, respectively). This species is characterized by a large elliptic elongated copulatory bulb, 85 μm in length, surrounded by several layers of muscles. An evident penis papilla is present at its caudal end, and the number of testes is above 30. *Minona cornupenis* from California has a long tubular penis, as long as the bulb, a stylet 30 μm long, a muscular vagina and about 30 testes.

Minona puertoricana and *M. paulmartensi* are easily distinguishable from each other by karyotype, relative position of genital openings, stylet length, and habitat.

Since the vagina often develops late or is lacking in certain maturity stages (Karling 1966; and see under *M. puertoricana*), species originally described as without a vagina should be taken into consideration for dis-

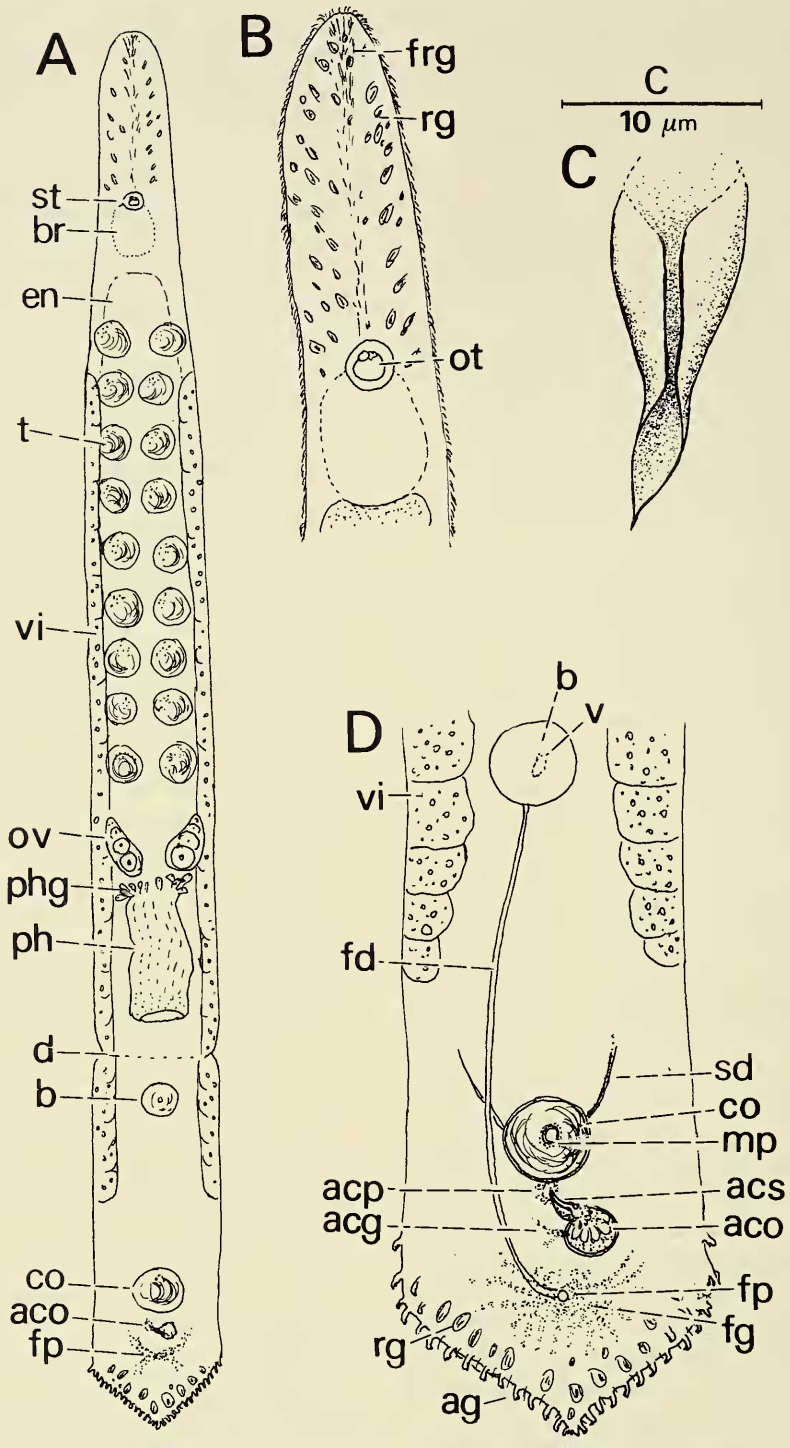

Fig. 1. *Minona puertoricana*: A, General organization, from a living animal in dorsal view; B, Details of the cephalic region; C, Accessory stylet from a whole mount; D, Genital organs in a living animal. *Acg*; accessory organ glands; *aco*: accessory organ; *acp*: accessory organ pore; *acs*: accessory organ stylet; *ag*: adhesive glands;

cussion. These are: *M. baltica* Karling & Kinnander, 1953; *M. obscura* Karling, 1966; *M. bermudensis* Ax & Sopott-Ehlers, 1985; *M. fernandinensis* Ax & Ax, 1977; *M. indonesiana* Martens & Curini-Galletti, 1989; and *M. beaglei* Martens & Curini-Galletti, 1989. *Minona baltica* is a brackish-water species from northern Europe and eastern Canada; it has a large stylet, being 40–50 μm long. *Minona obscura,* from California, has two pigmented eyes and brown pigment in the parenchyma. *Minona bermudensis* has 60–65 testes, very large squarish bursa, a stylet of 25–28 μm, and, at least in the Puerto Rico specimens attributed to this species, a fused male pore-accessory organ pore (see below). *Minona fernandinensis,* from the Galápagos, has 80–90 testes and a stylet of 35–38 μm. *Minona indonesiana,* from Sulawesi, lacks a bursa, has a large male antrum, and a stylet of 30–32 μm. *Minona beaglei,* from northern Australia, has a bursa consisting of several distinct vesiculae. *Minona hastata* Martens & Curini-Galletti, 1989, from Sulawesi, whose number of genital openings could not be established, has a very long (70 μm) accessory stylet.

The condition with four genital openings is considered as the plesiomorphic state within the genus *Minona* (Ax & Sopott-Ehlers 1985); since the two new species do not appear to share any synapomorphy with any other known species of the genus, their phylogenetic position cannot be determined at the moment.

Minona bermudensis Ax & Sopott-Ehlers, 1985

Minona bermudensis Ax & Sopott-Ehlers, 1985:377–379.—Martens & Curini-Galletti, 1989:185.

Studied material.—Four specimens (St. Ia).

Distribution.—Bermuda (Shelly Bay, Whalebone Bay) (Ax & Sopott-Ehlers 1985); Puerto Rico (Magueyes Is.).

Karyotype.—Haploid set made up of three chromosomes, almost of the same size. Chromosome 1 metacentric; chromosomes 2 and 3 submetacentric. Absolute length of haploid genome: 7.3 ± 0.7 μm. NF = 6 (Fig. 4D, Table 1).

Remarks.—Specimens from Puerto Rico correspond to the original description of *M. bermudensis* with respect to the number of testes, presence of a broad squarish bursa, stylet size (Bermuda: 25–28 μm; Puerto Rico: 28.72 ± 2.36 μm, $n = 4$), and general topography of the copulatory organs. In the original description the number of genital openings is not given; in specimens from Puerto Rico a vagina was not observed, and the male copulatory organ and the accessory organ had a large common opening. Specimens from both Bermuda and Puerto Rico were found in coarse, littoral sediments.

Minona peteraxi Karling, 1978

Minona peteraxi Karling, 1978:226–228.—Martens, 1983:154–155.—Sopott-Ehlers & Ax, 1985:340.

Studied material.—Two specimens (St. VI).

Distribution.—Bermuda (several places around the Biological Station) (Karling 1978); Puerto Rico (Turrumote Cay).

Karyotype.—Haploid set made up of three chromosomes, the smallest being nearly ⅔ the length of the largest. Chromosomes 1 and 3 submetacentric; chromosome 2 metacentric. Absolute length of haploid genome: 10.5 ± 1.0 μm. NF = 6 (Fig. 4E, Table 1).

←

b: bursa; *br*: brain: *co*: copulatory organ; *d*: diaphragm; *e*: eye; *en*: enteron; *fd*: female duct; *fg*: female glands; *fp*: female pore; *frg*: frontal glands; *mp*: male pore; *o*: oily droplets; *od*: oviduct; *ov*: ovary; *ot*: otolith; *ph*: pharynx; *phg*: pharyngeal glands; *pi*: pigment; *rg*: rhabdoid gland; *sd*: seminal duct; *st*: statocyst; *t*: testes; *v*: vaginal pore; *vi*: vitellary.

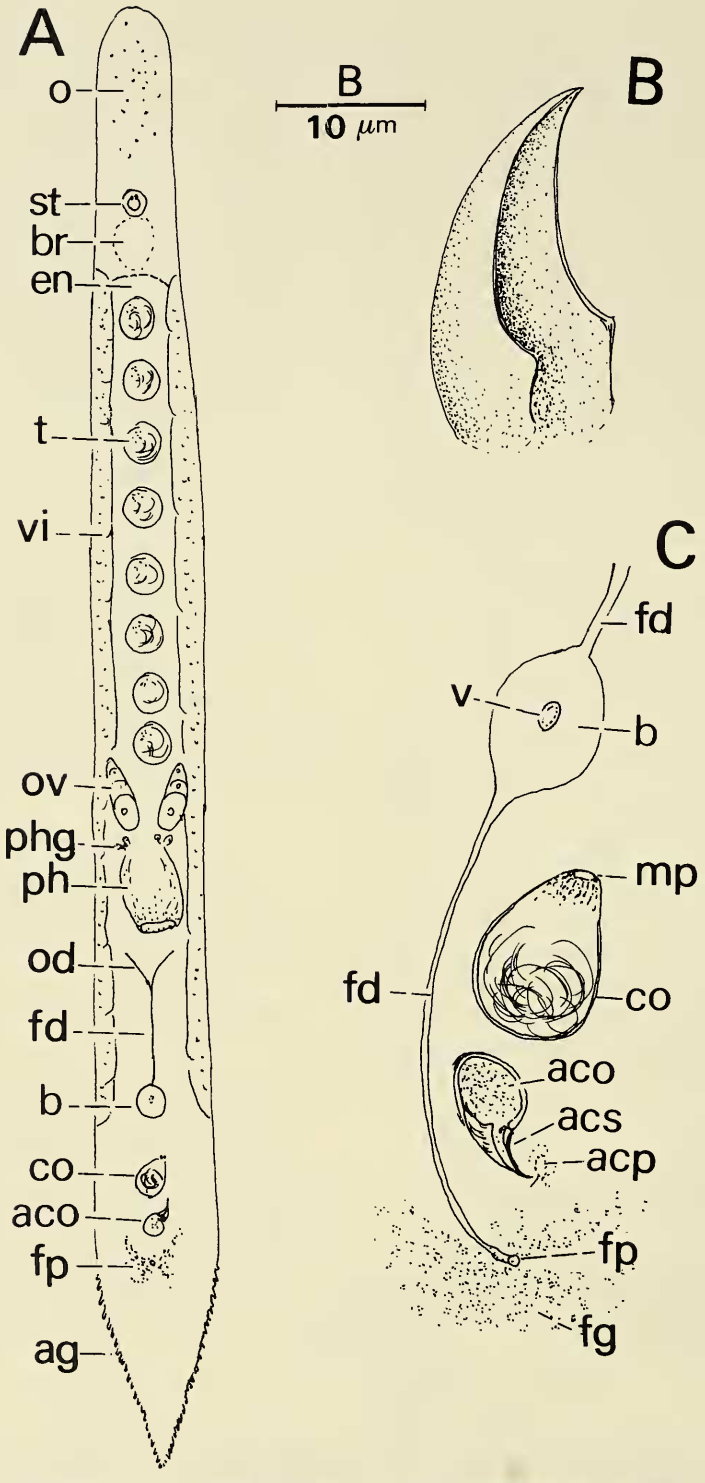

Fig. 2. *Minona paulmartensi*: A, General organization, from a living animal in dorsal view; B, Accessory stylet, from a whole mount; C, Genital organs in a living animal.

Remarks.—A highly characteristic species because of its peculiar pigmentation, eyes at the extreme anterior tip, and paired vaginae. This species has a broad ecological spectrum in Bermuda (fine sand, sand with mud, sand with gravel, on algae and hydroids) (Karling 1978), whereas in Puerto Rico it has been found only in granule, almost devoid of silt-clay fraction, in shallow water.

Minona gemella Ax & Sopott-Ehlers, 1985

Minona gemella Ax & Sopott-Ehlers, 1985: 375–377.

Studied material.—Thirty-one specimens (St. VI, VII).

Distribution.—Bermuda (Long Bay, Mylords Bay) (Ax & Sopott-Ehlers 1985); Puerto Rico (Turrumote Cay).

Karyotype.—Haploid set made up of two chromosomes, the smallest nearly ⅔ the size of the largest. Both chromosomes metacentric; chromosome 1, however, is nearly at the border with the submetacentric class. Absolute length of haploid genome: 6.3 ± 0.4 μm. NF = 4 (Fig. 4E, Table 1).

Remarks.—This species is characterized by the presence of two accessory organs, one (rostral) in front and one (caudal) behind the copulatory organ. According to the original description (Ax & Sopott-Ehlers 1985), the rostral accessory organ joins the vagina to form a common pore; nothing could be stated for the other pores. In the Puerto Rico specimens, a common vagina + rostral accessory organ pore could not be detected; the male copulatory organ and the caudal accessory organ joined to form a large common pore; the female pore was distinct. There were over 50 testes in the Puerto Rico animals, about 20 in Bermuda specimens. The stylet of the caudal accessory organ is described by Ax & Sopott-Ehlers (1985) as broader and less curved than the rostral accessory organ stylet; their lengths are 30 μm and 25 μm, respectively. In specimens from Puerto Rico the two stylets were similar in shape and length, attaining sizes of 33.5 ± 9.9 μm (range 22.6–50.7 μm) and 32.3 ± 14.2 μm (range 22.0–53.6 μm) (n = 14), respectively. The species appears exceedingly variable in Puerto Rico as far as stylet length is concerned; furthermore, about half of the specimens lacked the rostral accessory organ. It is not clear whether this structure is attained only at maturity; the specimens examined had no evident signs of immaturity.

Minona gemella was found in Bermuda in medium to coarse sand; in Puerto Rico it is restricted to areas of granule, almost without silt-clay fraction.

Genus *Monocelis*

Monocelis alboguttata, new species Figs. 3, 4F

Type material.—One whole mount (BIO-20).

Type locality.—Caballo Blanco reef, 16 m (St. V).

Studied material.—Three specimens, one mounted in lactophenol (holotype), the others used for karyology.

Etymology.—From latin *albus* (white) and *gutta* (drop); it refers to the peculiar cephalic pigmentation.

Description.—Living worms about 2 mm in length, without pigmented eyes. Cephalic area in front of statocyst scattered with numerous small pigmented dots, which are white in reflected, black in transmitted light. They are irregularly arranged and variable in the three specimens found. Caudal region somewhat elongated, with numerous adhesive glands and tiny rhabdoid glands. Pharynx slightly longer than wider, located in second third of body.

Between 14–20 testes present. Globular copulatory bulb about 70 μm in diameter, with an ill-defined penis papilla. In front of penial papilla, a sphaerical bursa is located, similar in size to copulatory bulb, with distinct, rounded, wide vagina. A straight fe-

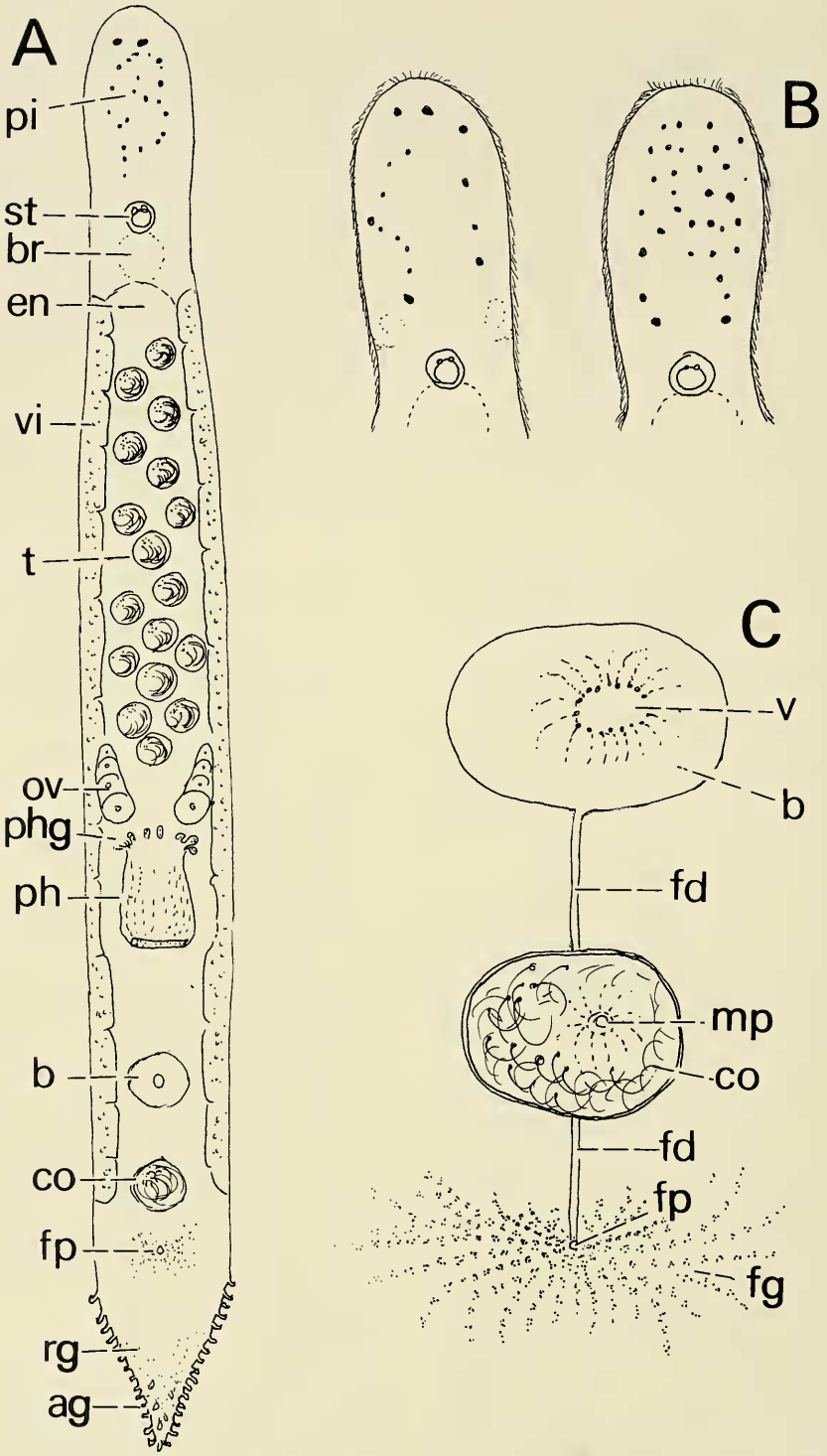

Fig. 3. *Monocelis alboguttata*: A, General organization, from a living animal in dorsal view; B, Cephalic region in two specimens; C, Genital organs in a living animal.

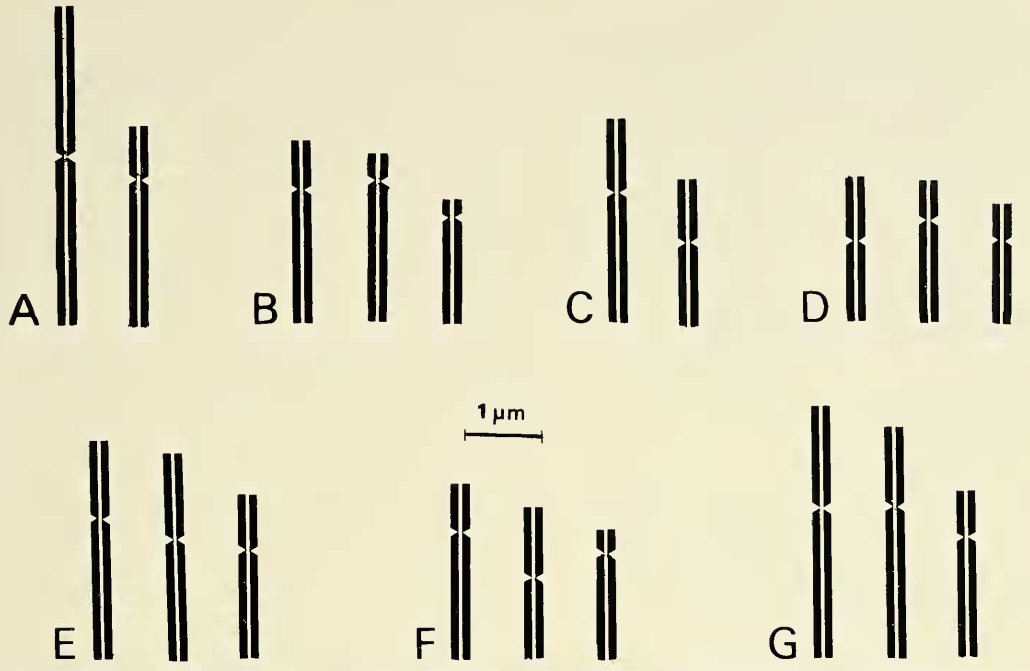

Fig. 4. Idiograms (based on absolute lengths) representing the haploid sets of *Minona puertoricana*: (A), *Minona paulmartensi* (B), *Minona gemella* (C), *Minona bermudensis* (D), *Minona peteraxi* (E), *Monocelis alboguttata* (F), and *Monocelis tabira* (G).

male duct was seen departing from the bursa; posterior to copulatory bulb the female duct opens into a female pore, which is surrounded by glands.

Karyotype.—Haploid set made up of three chromosomes, the smallest almost ⅔ the length of the largest. Chromosome 1 subtelocentric, bordering at submetacentric (c.i.: 24.98); chromosome 2 metacentric; chromosome 3 subtelocentric. Absolute length of haploid genome: 8.2 ± 1.1 µm (Fig. 4F, Table 1).

Diagnosis.—*Monocelis* species without eyes and with numerous pigmented dots in front of the statocyst. With three genital openings; bursa and copulatory bulb approx. the same size. Pore indices: d > a > b = c; Karyotype formula: 2N = 6: 1m + 2st; haploid genome length: 8.2 µm. NF = 4.

Discussion.—The systematics of the genus *Monocelis* is complex due to the large number of very similar species. In addition to the new species, species devoid of pigmented eyes and with a vagina are: *M. balanocephala* (Bohming, 1902); *M. cincta* Karling, 1966; *M. tenella* Karling, 1966; *M. hopkinsi* Karling, 1966; *M. colpotriplicis* Tajika, 1982; and *M. spectator* Sopott-Ehlers & Ax, 1985.

Monocelis balanocephala, from the Magellan Strait area, has paired vaginae. In all the other species, except the new species, the vagina is situated far from the male pore, pore index b having the highest value. Furthermore, *M. colpotriplicis* from Japan has a bursa much smaller than the copulatory bulb and a distinctly muscular penis; *M. cincta,* from California, has a brown transversal pigment girdle in front of the statocyst; *M. tenella* from California has a distinct male antrum, and its cephalic region is packed with short rod-shaped rhabdites, whereas they are long, needle shaped, in *M. hopkinsi* from California and *M. spectator*

Table 1.—Karyometric data (means ± *SD*) of the haploid complements of *Minona* and *Monocelis* species from Puerto Rico. Nomenclature: m = metacentric; sm = submetacentric; st = subtelocentric.

	Chromosome			Haploid genome length (μm)
	1	2	3	
Minona puertoricana, new species				
a.l. (μm):	5.7 ± 0.4	3.5 ± 0.4		
r.l.:	61.81 ± 1.80	38.19 ± 1.80		9.3 ± 0.8
c.i.:	47.19 ± 1.49	28.13 ± 3.93		
Nomenclature:	m	sm		
Minona paulmartensi, new species				
a.l. (μm):	3.2 ± 0.3	3.0 ± 0.3	2.2 ± 0.3	
r.l.:	37.92 ± 1.84	36.08 ± 1.34	25.99 ± 1.34	8.5 ± 0.8
c.i.:	27.65 ± 4.89	16.50 ± 2.16	16.81 ± 4.29	
Nomenclature:	sm	st	st	
Minona peteraxi				
a.l. (μm):	3.9 ± 0.5	3.7 ± 0.3	2.9 ± 0.3	
r.l.:	37.03 ± 1.70	35.21 ± 1.47	27.76 ± 2.35	10.5 ± 1.0
c.i.:	35.04 ± 2.98	40.91 ± 1.86	32.71 ± 3.39	
Nomenclature:	sm	m	sm	
Minona bermudensis				
a.l. (μm):	2.6 ± 0.3	2.5 ± 0.2	2.2 ± 0.2	
r.l.:	35.45 ± 1.71	34.30 ± 1.55	30.19 ± 1.79	7.3 ± 0.7
c.i.:	44.90 ± 2.56	28.56 ± 6.03	33.77 ± 4.71	
Nomenclature:	m	sm	sm	
Minona gemella				
a.l. (μm):	3.7 ± 0.2	2.6 ± 0.2		
r.l.:	58.66 ± 1.59	41.34 ± 1.59		9.5 ± 1.5
c.i.:	37.74 ± 3.48	44.95 ± 2.34		
Nomenclature:	m	m		
Monocelis alboguttata, new species				
a.l. (μm):	3.1 ± 0.5	2.7 ± 0.2	2.3 ± 0.4	
r.l.:	38.14 ± 1.81	34.14 ± 2.28	27.70 ± 2.36	8.2 ± 1.1
c.i.:	24.98 ± 5.42	45.48 ± 1.31	15.10 ± 6.65	
Nomenclature:	st	m	st	
Monocelis tabira				
a.l. (μm):	4.5 ± 0.4	4.1 ± 0.5	3.0 ± 0.3	
r.l.:	38.78 ± 2.09	35.31 ± 2.15	25.92 ± 1.43	11.6 ± 1.1
c.i.:	39.98 ± 2.11	34.51 ± 3.57	26.88 ± 4.45	
Nomenclature:	m	sm	sm	

from Washington. In addition, the pigmentation of *M. alboguttata* is unique among the Monocelididae.

Karyotypes of some *Monocelis* species are known (Martens & Curini-Galletti 1987). *Monocelis alboguttata* has a slightly modified basic karyotype for the genus, because of pericentric inversions.

Since a phylogenetic revision of the genus *Monocelis,* taking into account morphological and karyological data, has yet to come, the relationships of the new species cannot be determined at present.

Monocelis tabira Marcus, 1950

Monocelis tabira Marcus, 1950:54–56.—Westblad, 1952:33–34.—Marcus, 1954b:

32.—Karling, 1966:505.—Ax & Ax, 1977: 14–15.

Studied material.—Six specimens (St. Ib, II and III).

Distribution.—Brazil (Baia de Santos, Sao Sebastiao Is., Rio de Janeiro) (Marcus 1950); Puerto Rico (Magueyes Is.). Westblad's (1952) attribution to this species of specimens from the Falkland Is. is dubious (see Karling 1966 and Marcus 1954b).

Karyotype.—Haploid set made up of three chromosomes, the smallest nearly ⅔ the size of the largest. Chromosome 1 metacentric; chromosomes 2 and 3 submetacentric. Absolute length of haploid genome: 11.6 ± 1.1 μm. NF = 6 (Fig. 4G, Table 1).

Remarks.—Marcus (1950) did not report the existence of any rhabdoid cells in the cephalic area of *M. tabira,* which contrasts with the very small dot-like rhabdoids present in the Puerto Rico specimens. However, these rhabdoids are possibly not easily appreciable in sections, while the Puerto Rico specimens agree in any other respect with Marcus's description of *M. tabira.* The high value of the genome size is distinctive within the genus *Monocelis* (see Martens & Curini-Galletti 1987) and is probably an apomorphic character for the species.

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